



Gaming And XR Solutions

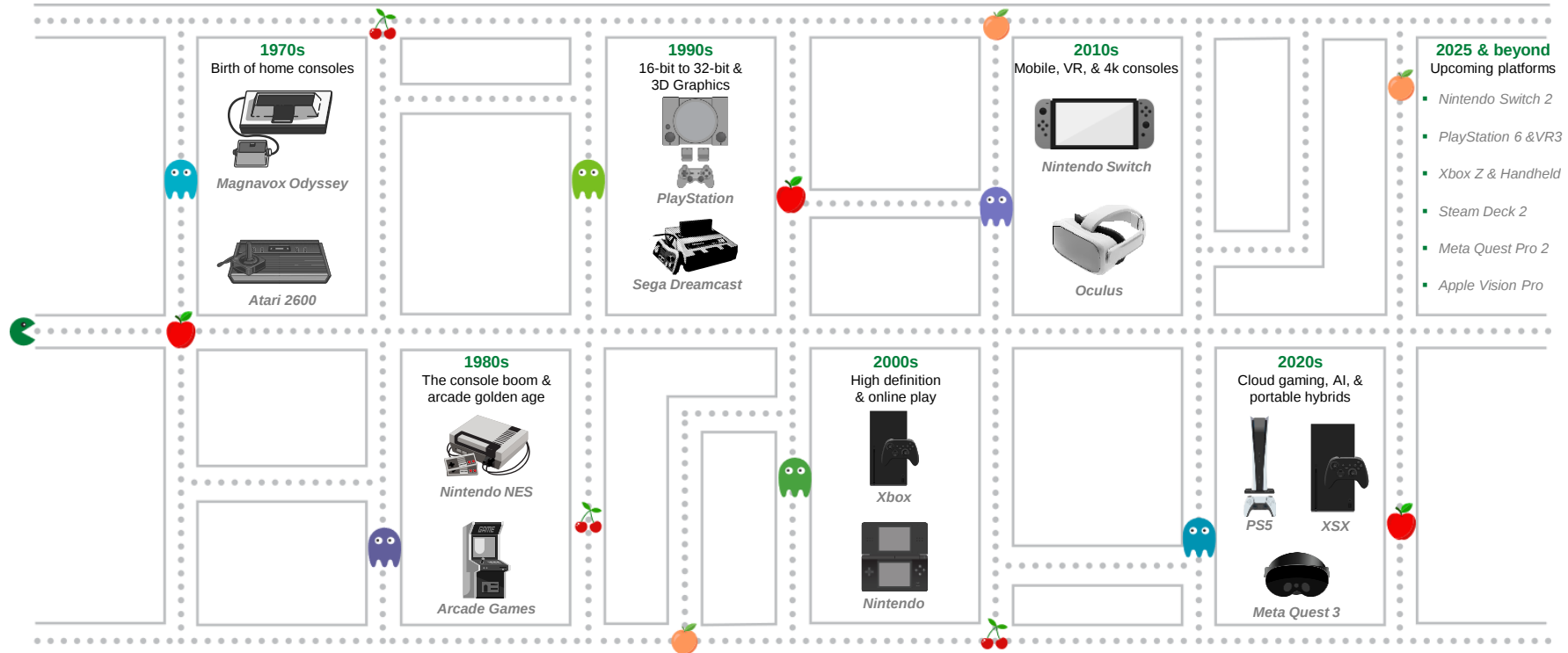


Consumer Electronics



Expertise Applied | Answers Delivered

Bits, buttons, and beyond: The evolution of gaming hardware



Simple 8-bit circuits → powerful, immersive systems blending real-time graphics, AI, & extended reality

Technical trends in gaming hardware & accessories

Advanced batteries & charging

- USB-C with Power Delivery (up to 240 W) now standard in gaming laptops, controllers, and handhelds.
- Use of solid-state batteries in wireless accessories for higher safety and density.
- Longer battery life demands ultra-low leakage components and intelligent power management ICs.

AI-integrated hardware

- AI to enhance user experiences, such as adaptive gameplay and real-time content generation.
- AI systems in headsets, controllers, and laptops need fast-response, precision protection.
- Smart thermal management using predictive AI for power/heat balancing in consoles and laptops.

Next-generation connectivity standards

- Widespread shift to USB4, Thunderbolt 4, HDMI 2.1, and DisplayPort 2.0+.
- High-speed signal integrity mandates ultra-low capacitance ESD protection.

Wireless & immersive technology

- Bluetooth low-latency, WiFi 6/7, and haptic feedback are becoming standard.
- VR/AR hardware integrates more sensors, tactile actuators, and advanced feedback loops.
- Growing need for rugged switches, sealed contacts, and shock/vibration protection in wearable gaming gear.

Modular & customizable hardware platforms

- Rise of modular gamepads, keyboards, & build-your-own headsets demands precision switches with distinct actuation profiles.
- Plug-and-play switch systems (e.g., magnetic or hot-swappable modules).
- Electronics must support modularity without compromising signal or protection integrity.

Gaming hardware and accessories market analysis

■ Home consoles

- Market saturated/stable
- PS5 continues to lead the market
- PS6/XSZ ramping ~2027–2028
- Cloud computing will supplement home consoles, not replace

■ Handheld devices

- Nintendo Switch market leader
- Steam Deck-style growth driver
- Rise of hybrid devices

■ Controllers

- Demand tied to console growth
- Increase in replacement and/or additional controllers
- Growth in gaming PC/Bluetooth cross-platform use

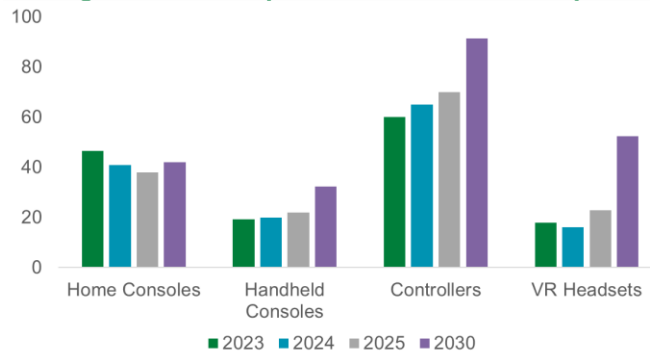
■ VR/HR Headsets

- Quest, Vision Pro, and PS VR3 expected to drive new demand
- Price reduction will lead mass adoption
- Mixed reality (MR) becoming standard

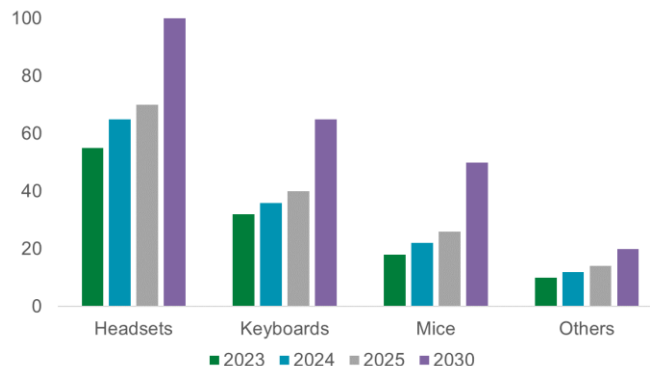
■ Gaming accessories

- Rise of multiplayer and online gaming
- Custom keyboards and RGB gears
- PC gaming expansion
- Advances in audio and wireless technology

Gaming hardware shipments & 2030 forecast (M units)



Gaming accessories shipments & 2030 forecast (M units)





Gaming consoles & XR devices

Home console (device connected to external monitor)

Internal Power Supply

Fuse, MOV, TVS Diode,
Si/SiC Schottky Diode



USB-C

eFuse, TVS Diode Array,
Temperature Indicator



Ethernet

TVS Diode Array



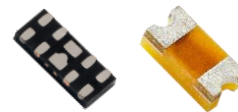
UI button

Tactile Switch



Video Interface (HDMI)

TVS Diode Array,
Polymer ESD Suppressor

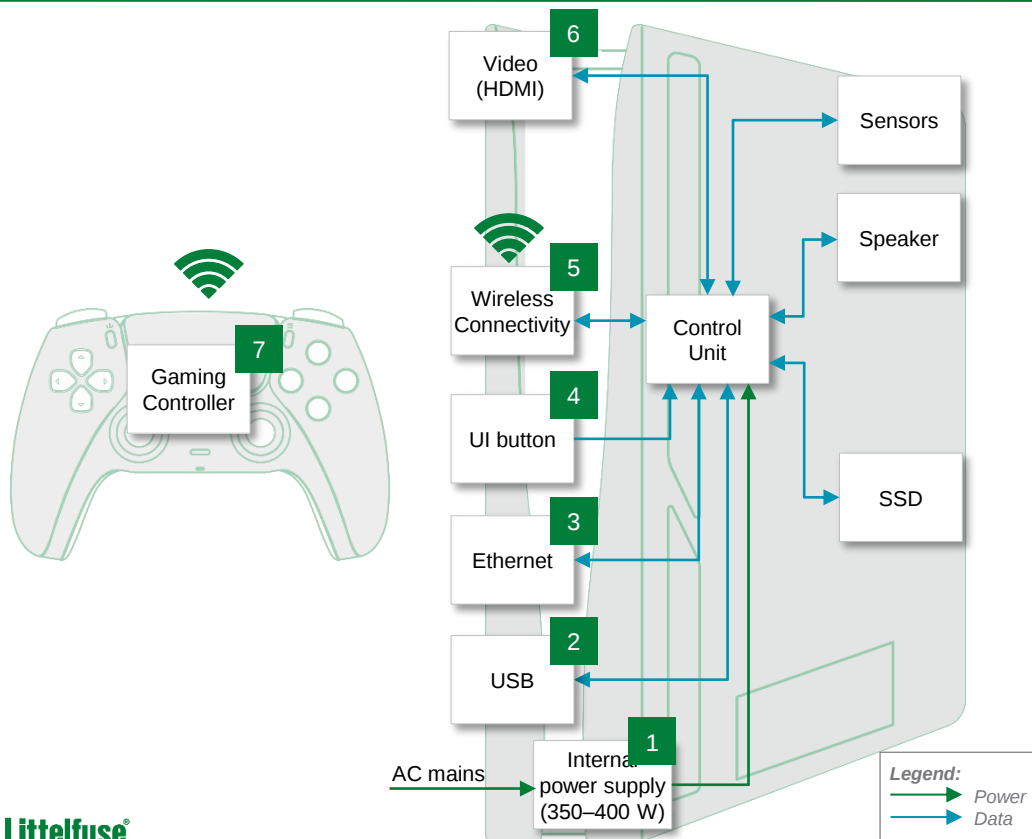


Wireless Connectivity

Polymer ESD Suppressor



Home console block diagram



	Technology	Product series
1	Fuse	875, 807, 373
	MOV	C-III, TMOV
	TVS Diode	P6KE, P6SMB, 8.0SMDJ, 1.5SMB
	Si/SiC Schottky Diode	DSEI, DSEP, DPG, MBR, DST
2	Protection IC (eFuse) (USB-C)	LS0505EVD22, LS0504EDD12
	Digital Temperature Indicator	SETP0805-100-CC
	TVS Diode Array	SPHV-C, SC1205-01ETG, SP3522, SP1020
3	TVS Diode Array	SRV05-04HTG-D
4	Tactile Switch	KMT0, KSC7, KSC11, KMR4, PTS645
5	Polymer ESD	XGD10603
6	TVS Diode Array OR Polymer ESD Suppressor	SP1004U-ULC-04UTG, SP3420-04UTG OR PulseGuard®
7	Gaming Controller	

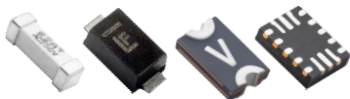
Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1	Fuse	Protects the power stage from overcurrent events	875 , 807 , 373	Reduces customer qualification time by complying with third-party safety standards, such as UL/IEC	Compliance with third-party safety standards, such as UL/IEC; low internal resistance; shock safe
	MOV	Protects the power supply unit from voltage transients and lightning	C-III , TMOV	Reduces customer qualification time by complying with third-party safety standards, such as UL/IEC	High energy absorption capability: 40–530 J (2 ms); integrated thermal protection
	TVS Diode	Protects the power supply unit from voltage transients	P6KE , P6SMB , 8.0SMDJ , 1.5SMB	Improves system's reliability by protecting downstream components from transients	600 W peak pulse capability; glass-passivated chip junction
	Si/SiC Schottky Diode	Rectification and blocking in power supply units	DSEI , DSEP , DPG , MBR , DST	Excellent surge capability; extremely fast; temperature-independent switching behavior; enables the design of high-efficiency power supplies	Low leakage current; very short recovery time; low I _m values; ultra-low forward voltage drop; high-frequency operation
2	Protection IC (eFuse)	Integrated overcurrent and overvoltage protection	LS0505EVD22 , LS0504EDD12	Integrated solution with features such as current limit protection, thermal shutdown, and internal soft start	5 V, 5 A eFuse with 30 V max and overvoltage protection/overcurrent protection
	Digital Temperature Indicator	Used to sense overheating of USB-C connector	SETP0805-100-CC	Enables maximum power delivery and fast charging without power loss or self-heating	Fully compliant with USB type-C plugs and USB-IF
	TVS Diode Array	Protects against ESD on high-speed data lines	SPHV-C , SC1205-01ETG , SP3522 , SP1020	Maintains signal integrity of high-speed data lines; reliable ESD protection	Small footprint; extremely low dynamic resistance
3	TVS Diode Array	Protection from ESD and EFT	SRV05-04HTG-D	Ensures design meets all regulatory requirements; preserves signal integrity	Low capacitance; low leakage current; small design; four lines of protection
4	Tactile Switch	Function control: On/Off button; reset button	KMT0 , KSC7 , KSC11 , KMR4 , PTS645	Board space-saving and design flexibility; improves lifetime and reliability of the end equipment	IP67 sealed; smallest thickness with integrated actuator; extended life cycles; smallest footprint
5	Polymer ESD	Protection against ESD	XGD10603	Preserves signal integrity; withstands high levels of ESD	Extremely low capacitance (0.09 pF); high ESD withstand rating (30 kV)
6	TVS Diode Array	Protection of data signal lines from ESD	SP1004U-ULC-04UTG , SP3420-04UTG	Low capacitance makes it ideal for high-speed interfaces, such as HDMI; small form factor allows designers layout flexibility	Low capacitance; low clamping voltage; industry standard DFN footprint
	Polymer ESD		PulseGuard®	Virtually no capacitance; compact design	Very low capacitance; low leakage current; small form factor
7	Gaming Controller				

Handheld gaming console

USB Type-C Adapter

Fuse, TVS Diode,
Temperature Indicator, eFuse



USB-C Connector

eFuse, TVS Diode Array,
Temperature Indicator



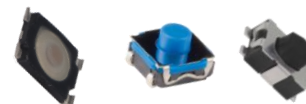
Controller

Tactile Switch,
Thumbstick Switch



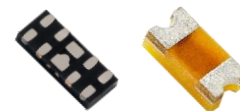
UI Button

Tactile Switch



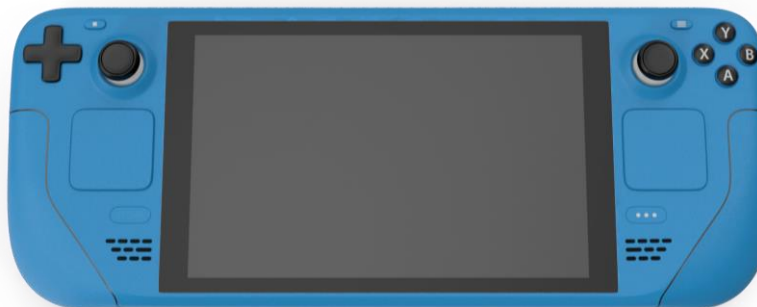
Video/Audio Interface

TVS Diode Array,
Polymer ESD Suppressor



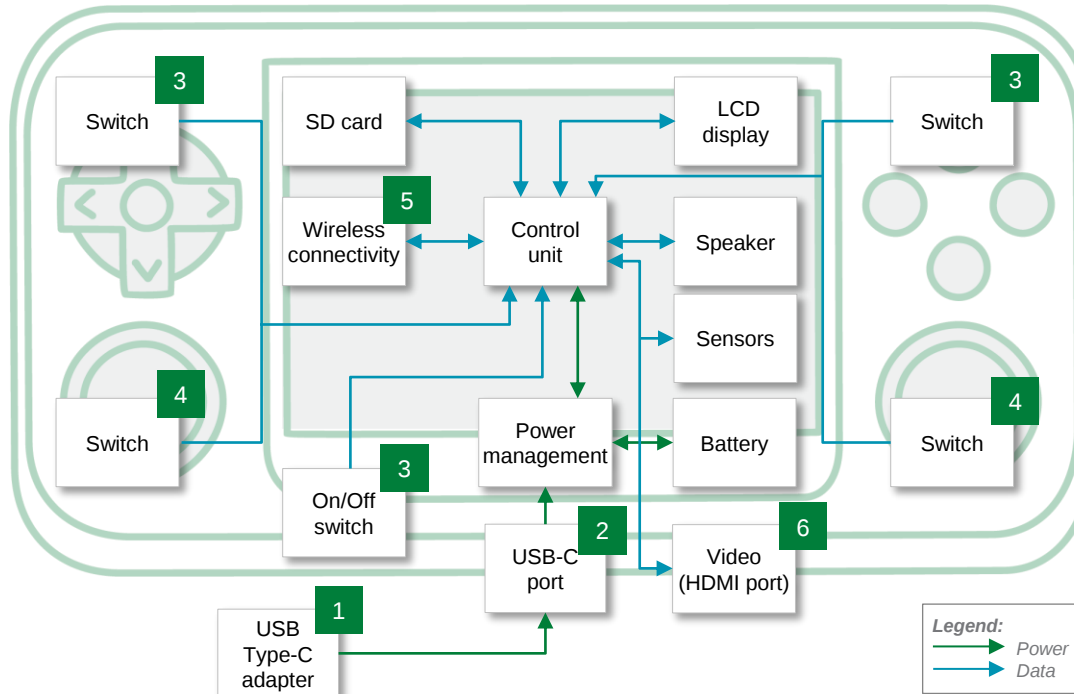
Wireless Connectivity

Polymer ESD Suppressor



Expertise Applied | Answers Delivered

Handheld gaming console block diagram



	Technology	Product series
1	Fuse	218, 373, 443E
	TVS Diode	SMF4L , SME
	Digital Temperature Indicator	SETP0805-100-CC
	Protection IC (eFuse)	LSxx
2	Protection IC (eFuse) (USB-C)	LS0505EVD22 , LS0504EDD12
	TVS Diode Array	SPHV-C , SC1205-01ETG , SP3522 , SP1020
3	Tactile Switch	KMT0 , KSC7 , KSC11 , KMR4 , PTS645
4	Thumbstick	THB001P
5	Polymer ESD Suppressor	XGD10603
6	TVS Diode Array OR Polymer ESD Suppressor	SP1004U-ULC-04UTG , SP3420-04UTG OR PulseGuard®

Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1	Fuse	Protects the power stage from overcurrent	218 , 373 , 443E	Operating up to 125 °C	Designed to international (IEC) marking T3.15AL250V; meets the IEC 60127-2, sheet 3 specification for TimeLag fuses; convenient mounting available
	TVS Diode	Protects the power supply unit from voltage transients induced by lightning and voltage transient events	SMF4L , SMF	Improves system reliability by protecting against transients on power input	Low leakage current for battery-operated devices; low voltage for protection of sensitive ICs and I/O ports; 200 W/400 W peak pulse power capability
	Digital Temperature Indicator	Provides high-temperature indications to help protect USB-C plugs and receptacles against overheating	SETP0805-100-CC	Helps improve reliability and user experience by reducing the risk of thermal damage; easy integration into existing USB-C systems	Fast response to thermal events; small form factor; zero IR loss contribution; protects systems with a 100 W or higher power rating
	Protection IC (eFuse)	Provides overcurrent protection, overvoltage protection, overtemperature protection, and reverse current blocking	LSxx	High integration with multiple protections in compact size; prevents failure during hot-plug and hot-swap events	Wide operation voltage range (3 to 24 V); 28 V maximum input/output voltage; integrate a 24 mΩ ultralow on protection switch; external adjustable current limit (1~6 A)
2	Protection IC (eFuse)	Integrated overcurrent and overvoltage protection	LS0505EVD22 , LS0504EDD12	Integrated solution with features such as current limit protection, thermal shutdown, and internal soft start	5 V, 5 A eFuse with 30 V max and overvoltage and overcurrent protection
	TVS Diode Array	Protects against ESD on high-speed data lines	SPHV-C , SC1205-01ETG , SP3522 , SP1020	Maintains signal integrity of high-speed data lines; reliable ESD protection	Small footprint; extremely low dynamic resistance
3	Tactile Switch	Function control: On/Off button; reset button	KMT0 , KSC7 , KSC11 , KMR4 , PTS645	Board space-saving and design flexibility; improves lifetime and reliability of the end equipment	IP67 sealed; smallest thickness with integrated actuator; extended life cycles; smallest footprint
4	Thumbstick	Used as a joystick to control gaming application	THB001P	Miniature size allows board space-saving and design flexibility for PCB layout	High activation force; small form factor with improved ergonomics; high-quality dual axis lever with integrated center select switch
5	Polymer ESD	Protection against ESD	XGD10603	Preserves signal integrity; withstands high levels of ESD	Extremely low capacitance (0.09 pF); high ESD withstand rating (30 kV)
6	TVS Diode Array	Protection of data signal lines from ESD	SP1004U-ULC-04UTG , SP3420-04UTG	Low capacitance makes it ideal for high-speed interfaces such as HDMI; small form factor allows designers layout flexibility	Low capacitance; low clamping voltage; industry standard DFN footprint
	Polymer ESD		PulseGuard®	Virtually no capacitance; compact design	Very low capacitance; low leakage current; small form factor

VR and AR headsets with controllers

USB Charging

Temperature Indicator,
TVS Diode Array, eFuse



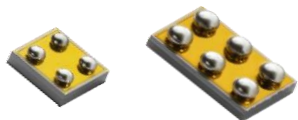
UI Buttons

Tactile Switch



Load Switching

Load Switch IC

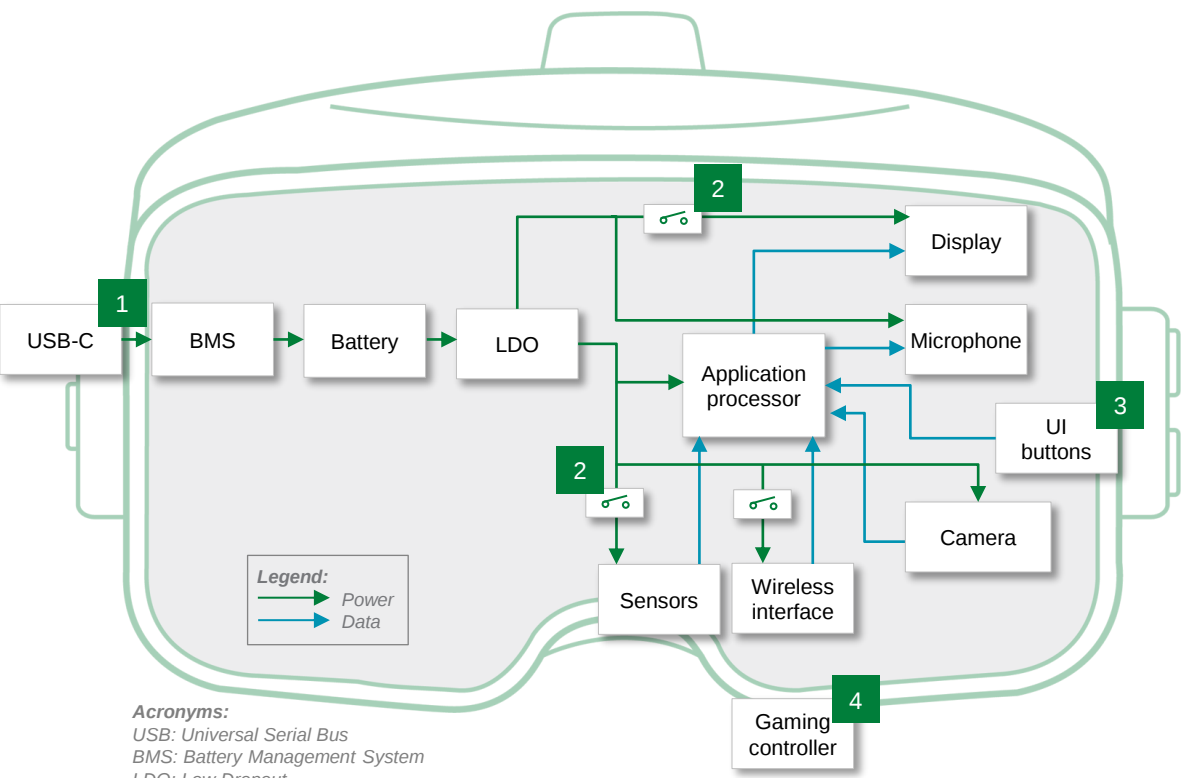


Controller

Tactile Switch,
Thumbstick Switch



VR and AR headset block diagram



Acronyms:
 USB: Universal Serial Bus
 BMS: Battery Management System
 LDO: Low Dropout

	Technology	Product series
1	Digital Temperature Indicator (USB-C)	setP™
	Protection IC (eFuse) (USB-C)	LS0505EVD22 , LS0504EDD12
	TVS Diode Array	SPHV-C , SC1205-01ETG , SP3522 , SP1020
2	Load Switch IC	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6
3	Switch	NanoT , KMT0 , KMR
4	Gaming Controller	

Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1	Digital Temperature Indicator (USB-C)	Provides thermal protection to USB-C port in AR and VR headsets in case of resistive shorts between the voltage and the ground due to debris or other contaminants	SetP™	Reliable overheating protection, regardless of power being delivered	Fully compliant with USB Type-C plugs
	Protection IC (eFuse) (USB-C)	Integrated overcurrent and overvoltage protection	LS0505EVD22 , LS0504EDD12	Integrated solution with features such as current limit protection, thermal shutdown, and internal soft start	5 V, 5 A eFuse with 30 V max for overvoltage and overcurrent protection
	TVS Diode Array	Protects against ESD on high-speed data lines	SPHV-C , SC1205-01ETG , SP3522 , SP1020	Maintains signal integrity of high-speed data lines; reliable ESD protection	Small footprint; extremely low dynamic resistance
2	Load Switch IC	Integrated electronic switches used to turn power rails on and off	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6	Reduces parasitic leakage current; improves system efficiency; increases battery lifetime; board space saving; low power consumption	Lowest quiescent current (IQ) and shutdown current (ISD); integrated slew rate control and output discharge switch; small package
3	Switch	Function control: activates the VR glasses, opens menu options, forces restart of VR glasses if unresponsive	NanoT , KMT0 , KMR	Board space-saving and design flexibility; reduces cost and integration difficulties versus designing full interface button; improves lifetime and reliability of the end equipment	Ultra-compact size; long life cycles; IP67 for sealed switch compatibility with PCB coatings
4	Gaming controller				

Wireless game controllers

USB

Temperature Indicator,
TVS Diode Array, eFuse



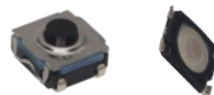
Battery Pack

Battery Strap,
Battery Mini-Breaker



Controller

Tactile Switch



Joystick

Thumbstick Switch

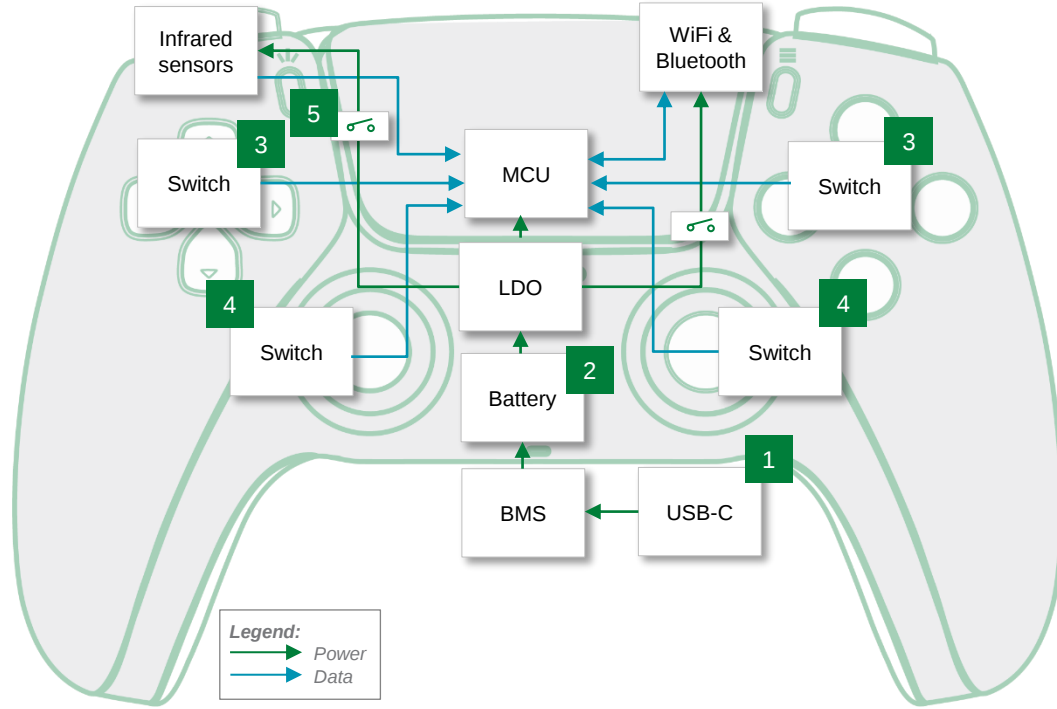


Load Switching

Load Switch IC



Wireless game controllers block diagram



Acronyms:
 MCU: Microcontroller Unit
 IC: Integrated Circuit

	Technology	Product series
1	Digital Temperature Indicator (USB-C)	setP™
	Protection IC (eFuse) (USB-C)	LS0505EVD22 , LS0504EDD12
	TVS Diode Array	SPHV-C , SC1205-01ETG , SP3522 , SP1020
2	Battery Strap OR Battery Mini-Breakers	VLR , VTP MHP-XXX
3	Tactile Switch	KMT0 , KSC7 , KSC11 , KMR4 , PTS645 , PTS845
4	Thumbstick	THB001P
5	Load Switch IC	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6

Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1	Digital Temperature Indicator (USB-C)	Protects cable connectors against overheating	SetP™	Reliable overheating protection, regardless of power being delivered	Fully compliant with USB Type-C plugs
	Protection IC (eFuse) (USB-C)	Integrated overcurrent and overvoltage protection	LS0505EVD22 , LS0504EDD12	Integrated solution with features such as current limit protection, thermal shutdown, and internal soft start	5 V, 5 A eFuse with 30 V max and overvoltage protection/overcurrent protection
	TVS Diode Array	Protects against ESD on high-speed data lines	SPHV-C , SC1205-01ETG , SP3522 , SP1020	Maintains signal integrity of high-speed data lines; reliable ESD protection	Small footprint; extremely low dynamic resistance
2	Battery Strap OR Battery Mini-Breakers	Overcurrent and over-temperature protection	VLR , VTP , MHP-XXX	Compact design suitable for situations where space is at a premium and resettable protection is desired	Low profile; fast response to fault currents; low resistance; low activation temperature
3	Tactile Switch	Function control: home button, action button, reset, direction pad, and so on	KMT0 , KSC7 , KSC11 , KMR4 , PTS645 , PTS845	Board space-saving and design flexibility; improves lifetime and reliability of the end equipment	Up to IP68 sealed; smallest thickness with integrated actuator; extended life cycles; smallest footprint
4	Thumbstick	Used as a joystick to control gaming application	THB001P	Miniature size allows board space-saving and design flexibility for PCB layout	High activation force; small form factor with improved ergonomics; high-quality dual axis lever with integrated center select switch
5	Load Switch IC	Integrated electronic switches used to turn power rails on and off	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6	Reduces parasitic current leakage; improves system efficiency; increases battery lifetime; board space saving; low power consumption	Lowest quiescent current (IQ) and shutdown current (ISD); integrated slew rate control and output discharge switch; small package



Gaming Accessories

Wireless headsets

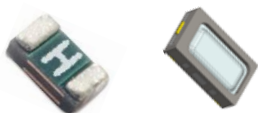
USB Charging

TVS Diode Array, eFuse,
Temperature Indicator



Wireless Charging

PolySwitch® Device,
Battery Mini-Breaker



UI Buttons

Tactile Switch, Slide Switch

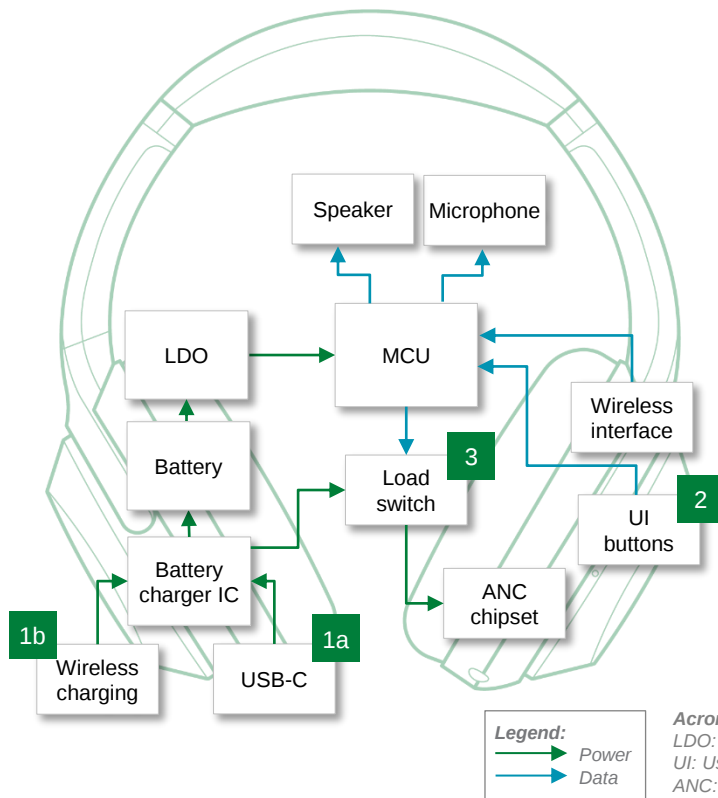


Load Switching

Load Switch IC



Wireless headsets block diagram



Acronyms:
 LDO: Low Dropout Regulator
 UI: User Interfaces
 ANC: Active Noise Cancellation
 USB-C: Universal Serial Bus-C

	Technology	Product series
1a	Protection IC (eFuse) (USB-C)	LS0505EVD22 , LS0504EDD12
	TVS Diode Array	SPxx , SP1006-01UTG , SP3522 , SP1020
	Digital Temperature Indicator	setP™
1b	PolySwitch® Device OR Battery Mini-Breakers	O603L MHP-TAS*
2	Switch	NanoT , KMT0 , KSC XA , PTS830 , JS , PCM , AYZ
3	Load Switch IC	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6

* New Product. Contact Littelfuse Sales for more details.

Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1a	Protection IC (eFuse) (USB-C)	Integrated overcurrent and overvoltage protection	LS0505EVD22 , LS0504EDD12	Integrated solution with features such as current limit protection, thermal shutdown, and internal soft start	5 V, 5 A eFuse with 30 V max and overvoltage protection/overcurrent protection
	TVS Diode Array	Protects against ESD on data lines and V _{BUS}	SPxx , SP1006-01UTG , SP3522 , SP1020	Maintains signal integrity of high-speed data lines; reliable ESD protection	Small footprint; extremely low dynamic resistance
	Digital Temperature Indicator	Protects cable connectors against overheating	setP™	Reliable overheating protection, regardless of power being delivered	Fully compliant with USB Type-C plugs
1b	PolySwitch® Device OR Battery Mini-Breakers	Protects against overcurrent and over-temperature protection	0603L MHP-TAS*	Compact design suitable for situations where space is at a premium and resettable protection is desired (for example, smart watches)	Low profile; fast response to fault currents; low resistance
2	Switch	Controls Bluetooth functions; power On/Off	NanoT , KMT0 , KSCXA , PTS830 , JS , PCM , AYZ	Board space-saving and design flexibility; reduces cost and integration difficulties versus designing full interface button; improves lifetime and reliability of the end equipment	Ultra-compact size; up to 500,000 life cycles; up to IP68 for sealed switch compatibility with PCB coatings, soft sound available
3	Load Switch IC	Integrated electronic switches used to turn power rails on and off	LQ05021QCS4 , LQ05021RCS4 , LQ05022QCS4 , LQ05041RCS6 , LQ05041QCS6	Reduces parasitic current leakage; improves system efficiency; increases battery lifetime; board space saving; low power consumption	Lowest quiescent current (IQ) and shutdown current (ISD); integrated slew rate control and output discharge switch; small package

* New Product. Contact Littelfuse Sales for more details.

Wireless keyboard and mouse

Keyboard

TMR Linear Sensor, TVS Diode Array

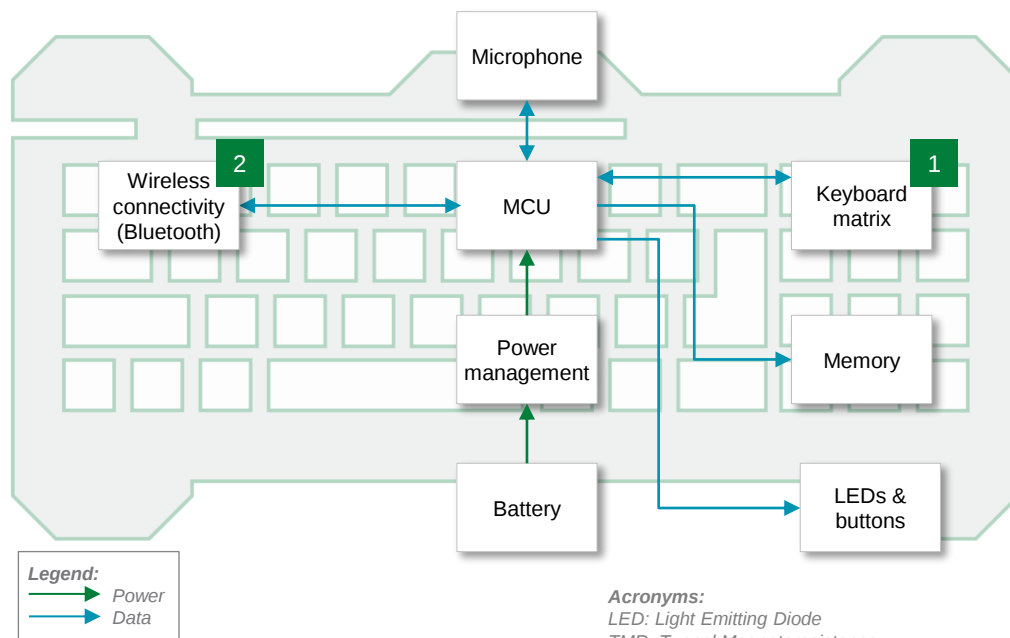


Wireless Connectivity

Polymer ESD Suppressor



Wireless keyboard block diagram



	Technology	Product series
1	TMR Linear Sensor	LF50001* (DFN3L – 1.6x1.6x0.5)
	TVS Diode	SMF4L , SMF
2	Polymer ESD Suppressor	XGD10603

* New Product. Contact Littelfuse Sales for more details.

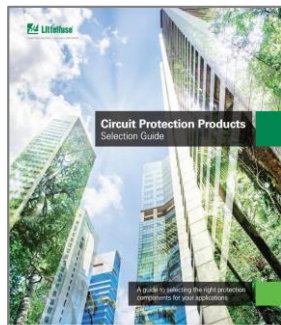
Features and benefits of Littelfuse products

	Technology	Function in application	Product series	Benefits	Features
1	TMR Linear Sensor	Magnetic programmable linear position sensing	LF50001* (DFN3L – 1.6x1.6x0.5)	Output voltage follows VDD changes; low noise; sensitivity with high consistency; low hysteresis	Supply voltage: 1.6 V to 5 V; static current consumption < 300 µA; output voltage: 5% to 95% VDD
	TVS Diode	Designed to protect sensitive systems or components from high voltage, high energy transients	SMF4L , SME	Low leakage makes it ideal for battery-powered devices; small footprint allows board space saving	Peak power rating of up to 400 W at 1 ms; typical response time faster than 1 ns
2	Polymer ESD	Protection against ESD	XGD10603	Preserves signal integrity; withstands high levels of ESD	Extremely low capacitance (0.09 pF); high ESD withstand rating (30 kV)

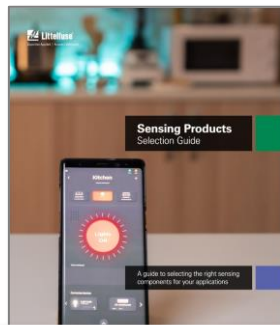
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Circuit Protection
Selection Guide



Sensing Products
Selection Guide



Li-Ion Battery Pack
Protection App Note

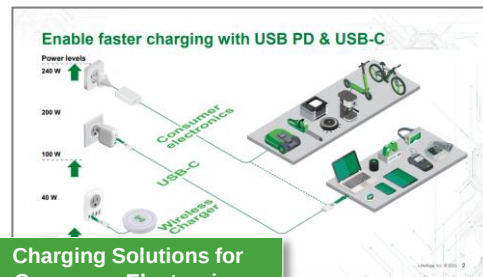


setP™ Design Guide



Switches for Wearable
Technology

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images for
more
information



Scan the code to
learn more!

Local resources supporting our global customers



Partner for tomorrow's electronic systems





Expertise Applied | Answers Delivered

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